

IN THE CLAIMS

1. (Currently Amended) An alcohol-air fuel cell comprising:
an anode chamber comprising an anode and a liquid fuel, an air chamber comprising a gas-diffusion cathode and a cathode catalyst, an electrolyte chamber comprising two distinct electrolytes: a liquid electrolyte and a membrane electrolyte, the electrolyte chamber being which is positioned between the cathode and the anode, wherein the anode is effective for oxidation of an alcohol, and wherein the liquid electrolyte is an aqueous alkaline solution and the cathode catalyst is a non-platinum catalyst, tolerant in respect to alcohol.
2. (Previously Presented) The fuel cell according to claim 1, wherein the membrane electrolyte is a porous matrix impregnated with an alkaline electrolyte.
3. (Previously Presented) The fuel cell according to claim 2, wherein the porous matrix is an asbestos matrix.
4. (Previously Presented) The fuel cell according to claim 1, wherein the membrane electrolyte is an anion-exchange membrane.
5. (Previously Presented) The fuel cell according to claim 4, wherein the anion-exchange membrane is a membrane of polybenzimidazole, doped with OH ions.
6. (Previously Presented) The fuel cell according to claim 1, wherein the cathode is a two-layer gas-diffusion electrode with a hydrophilic barrier layer facing toward the electrolyte chamber and with an active layer facing toward the air chamber.

7. (Previously Presented) The fuel cell according to claim 1, wherein the cathode is a two-layer gas-diffusion electrode with a hydrophobic barrier layer facing toward the air chamber and with an active layer facing toward the electrolyte chamber.

8. (Previously Presented) The fuel cell according to claim 1, wherein the anode comprises an active layer, comprising 3 - 7 wt. % of fluoroplastic, and a membrane comprising polybenzimidazole.

9. (Previously Presented) The fuel cell according to claim 1, wherein the anode comprises an active layer, comprising 2 - 7 wt. % of polybenzimidazole, and a membrane comprising polybenzimidazole.

10. (Previously Presented) The fuel cell according to claim 1, wherein the anode comprises a porous nickel band, filled with polybenzimidazole, and an active layer comprising 3 - 7 wt. % of fluoroplastic.

11. (Previously Presented) The fuel cell according to claim 1, wherein the anode comprises a porous nickel band, filled with polybenzimidazole, and an active layer comprising 2 - 7 wt. % of polybenzimidazol.

12. (Previously Presented) The fuel cell according to claim 1, wherein the anode comprises asbestos, impregnated with polybenzimidazole, and an active layer comprising 3 - 7 wt. % of fluoroplastic and 2 - 7 wt. % of polybenzimidazole.

13. (Previously Presented) The fuel cell according to claim 1, wherein the anode chamber comprises an anode catalyst comprising a nickel-ruthenium alloy.

14. (Previously Presented) The fuel cell according to claim 1, wherein the non-platinum catalyst comprises silver on a carbon carrier.

15. (Previously Presented) The fuel cell according to claim 14, wherein the silver on the carrier is 7 - 18 wt. %.

16. (Previously Presented) The fuel cell according to claim 14, wherein the carbon carrier comprises carbon black or graphite with a specific surface of at least 60 - 80 m²/g.

17. (Previously Presented) The fuel cell according to claim 1, wherein the non-platinum catalyst comprises pyropolymers of N₄ - complexes on a carbon carrier.

18. (Previously Presented) The fuel cell according to claim 17, wherein the content of the pyropolymer on the carbon carrier is 10 - 20 wt. %.

19. (Previously Presented) The fuel cell according to claim 17, wherein the carbon carrier comprises carbon black or graphite with a specific surface of at least 60 - 80 m²/g.

20. (Previously Presented) The fuel cell according to claim 13, wherein the anode catalyst comprises Raney nickel alloy with a ratio Ni:Al equal to 50:50.

21. (Previously Presented). The fuel cell according to claim 20, wherein the anode catalyst additionally comprises a molybdenum additive with the anode catalyst having a ratio of Ni:Al:Mo equal to 40:50:10.

22. (Previously Presented). The fuel cell according to claim 20, wherein the Raney nickel alloy in the anode catalyst is additionally promoted with platinum.

23. (Previously Presented) The fuel cell according to claim 21, wherein the Raney nickel alloy with molybdenum additive in the anode catalyst, is additionally promoted with platinum.

24. (Previously Presented) The fuel cell according to claim 22, wherein the anode catalyst has a content of platinum and ruthenium of 8 - 15 wt. % with the content of platinum equal to 0.08 - 0.3 wt. %.

25. (Previously Presented) The fuel cell according to claim 22, wherein the platinum and ruthenium are present in the anode catalyst in the form of crystals of Pt - Ru alloy having a size of 5 - 7 nm and a specific surface of 45 - 60 m²/g.

26. (Previously Presented) The fuel cell according to claim 13, wherein the anode has a three-layer structure including a porous base, a layer facing the electrolyte, filled with polybenzimidazole, and an active layer comprising a catalyst and polybenzimidazole.

27. (New) The fuel cell according to claim 1, wherein the membrane electrolyte is disposed between the liquid electrolyte and the anode.